

LANDOWNERS PERCEPTIONS OF CROP DAMAGE FROM WHITE-TAILED DEER IN SOUTH CAROLINA

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ABSTRACT: Survey respondents reported a definite increase in the population of white-tailed deer (*Odocoileus virginianus*) in South Carolina. Almost 73% of the producers from a random sample indicated that deer populations have increased over the five year period preceding 1991. With a higher deer population, crop damage from deer became more prevalent, and 72% of the producers indicated having some level of damage. The producers in the sample had mixed feelings about the damage their crops received with 70% indicating that the damage was either negligible or was tolerable in exchange for having deer around. In South Carolina the increasing deer population and problem with crop damage is regional in nature, with certain regions of the state being affected more than others. About one-third of the agricultural producers in South Carolina reflected an attitude that they were substantially negatively affected by deer damage to crops.

Proc. East. Wild. Damage Control Conf. 6:160-165. 1995.

"To a deer, a soybean field looks like a big dish of chocolate yogurt."

Jim Palmer, Soybean Specialist
Clemson University

The above quote by Dr. Jim Palmer of Clemson University's Extension Service may sound humorous to many, however to agricultural producers in South Carolina who have experienced crop damage from white-tailed deer (*Odocoileus virginianus*) the quote describes a serious problem. Agricultural and wildlife professionals across the nation agree that agricultural damage caused by wildlife, including deer, has been increasing nationwide over the past 30 years (Conover and Decker 1991).

In South Carolina, it is estimated that there is a substantial loss in revenue to agricultural producers from deer damaging crops. The increasing deer depredation in South Carolina is due in large part to increasing deer populations because of the inadequate harvest of doe deer. However, there is another factor -- the changing land use patterns which have increased human activity in prime deer habitat. Timber harvesting and the effects of Hurricane Hugo also have added to the deer problem, the difficulty of harvest, and with canopy closure added pressure for deer to encroach on agricultural lands. These large scale and wide spread alterations of deer habitat cause deer to venture into populous areas or areas of agricultural production where they are naturally attracted in order to locate food.

In order to address the issue of crop damage caused by deer, Clemson University, in cooperation with the South Carolina Wildlife and Marine Resources Department (SCWMRD), conducted a survey of South Carolina agricultural producers to determine the extent of crop damage. The goal of this project was to determine the extent of damage and develop policy actions which can be taken by the SCWMRD, landowners, and sportsmen, in order to moderate the effects of crop damage in the future. All groups involved, the SCWMRD, the landowner, and the sportsmen, must work together in order to better manage the deer population in South Carolina.

METHODS

Agricultural producers were asked to help in an effort to determine the level of crop damage caused by deer, and ascertain where this damage was occurring in South Carolina. A survey was conducted in 1992 which inquired about 1991 crop damage and deer population trends. Two samples, a random sample and a non-random sample of South Carolina agricultural producers were sent questionnaires. The random sample consisted of 3,018 persons selected from a list of 6,036 producers, all of which either owned or operated one hundred acres or more (list provided by the Agricultural Stabilization and Conservation Service).

The non-random sample, made up of 336 producers, was termed the deer "permit" sample and

consisted of producers who had petitioned and received shoot-to-kill permit(s) for deer. A shoot-to-kill permit allowed the agricultural producer to destroy a certain number of deer on their affected property. The number of deer a producer was allowed to destroy depended upon the intensity of crop damage experienced. In South Carolina law enforcement officers with SCWMRD are the authorized issuing agents.

The questionnaire contained some of the characteristics found in surveys previously conducted in Arkansas, Wisconsin, and Tennessee with additions specific to South Carolina (Wigley et al. 1989, Spencer et al. 1984, M. King, University of Tennessee, pers. commun.). The total design method (TDM) of mail questionnaire construction discussed in Dillman (1978) was used throughout the survey process.

From the random sample there were 1,153 questionnaires returned, a response rate of approximately 38% (1,153/3,018). The permit sample

had an even better response rate with 173 returned for a rate of approximately 51% (173/336).

RESULTS

Deer seemed to cause at least some damage to all sectors of South Carolina agriculture, from row crops to fruit trees. However, soybeans, tobacco, and cotton were the crops which sustained the most severe reported damage. The soybean producers responding to the questionnaire reported that 70% of their soybean acreage had some level of damage, tobacco producers reported 49% of acreage with some level of damage, and the cotton producers indicated having 41% of acreage damaged at some level. The explanation for this damage may come from the deer population trend. There was a definite increase in the population trend of deer in South Carolina with almost 73% of the producers (random sample) indicating that in their opinion deer populations have increased over the past five years (Fig. 1). The remaining producers either indicated a decrease in population, a status quo, or they did not know.

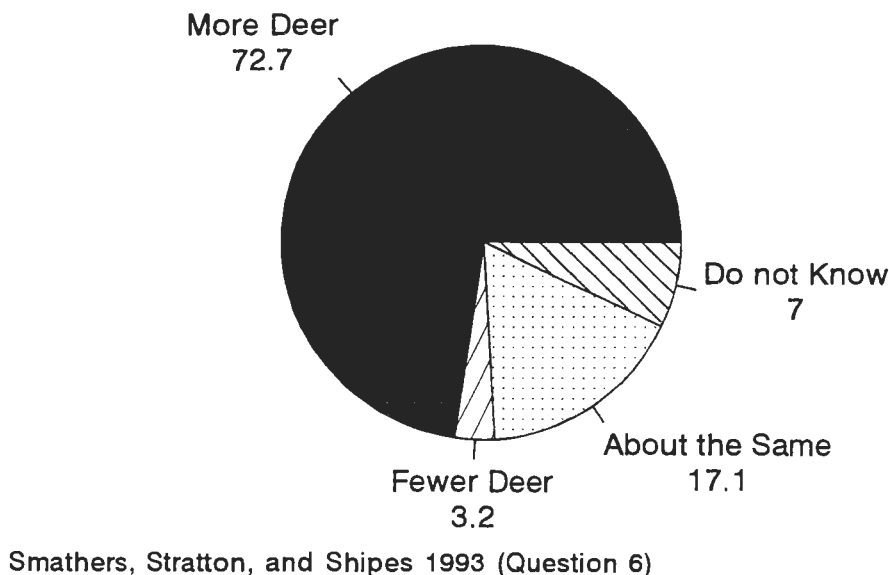


Fig. 1. Deer population trends.

Crop damage from deer varied throughout the state from none to severe. Almost 72% of the producers (random sample) indicated having some level of crop damage (Fig. 2). However, there were 310 (28.1%) respondents indicating that they had no damage.

The producers in the random sample had mixed feelings about the damage their crops received with 70% (n=768) indicating that the damage was either negligible or was tolerable in exchange for having deer around. The remainder of the respondents felt that the damage was unreasonable (Fig. 3). As might be expected a majority of the permit sample indicated that the amount of damage was unreasonable. Some level of crop damage from deer occurred on at least some segment of 30 percent of the respondents agricultural land.

Producers responses to damage to their crops (deterrents) was mixed. Some were attempting to do nothing while others were using fences and scare devices. The most common control measure reported was shoot-to-kill permits, however a majority (80.0%) of those reporting crop damage (in the random sample) did not apply for a shoot-to-kill permit. In the random sample 113 (20.0%) applied while 488 (80.0%) did not.

Producers from both samples had mixed feelings about the effectiveness of shoot-to-kill permits. From the random sample 54.2% of those applying for shoot-to-kill permits said they were effective while 45.8% said they were not (N=601). In the permit sample 55.4% indicated that the permits were effective while 54 (44.6%) said they were not (Fig. 4).

There were other non-lethal methods of controlling deer attempted to alleviate some of the crop damage from deer, such as chemical repellents, fence construction, and devices to scare deer. From the random sample, 171 (28.7%) of the producers used some non-harvesting method either in place of, or in conjunction with, harvesting deer, while 424 (71.3%) did not. Producers were then asked to indicate whether these methods were useful. Twenty producers responded with fence construction being the most beneficial and scare devices and chemical repellents being second and third in importance, respectively.

In the permit sample 116 (73.4%) took other steps to control crop damage, while 42 (26.6%) did not.

Five of the producers who took these steps indicated that fence construction and scare devices were the most beneficial. Of the control methods reported, there was a clear preference for lethal methods over non-lethal, and the lethal methods were reported to be far more effective.

Another control method indicated was a modification in the farm plan, for example, switching from growing soybeans to some other crop(s) because of crop damage to soybeans. In the random sample there were 265 (34.6%) who indicated a farm modification, while 500 (65.4%) did not. In the permit sample 93 (61.2%) said they modified their farm plan because of crop damage from deer, while 59 (38.8%) did not. In conversations with respondents, many of the farm plan modifications removed highly susceptible crops from small fields, and especially those small fields bordered by woods or cut over areas. Reduced soybean acreage in modified farm plans was due to crop damage, and reduced soybean prices were received at the farm gate.

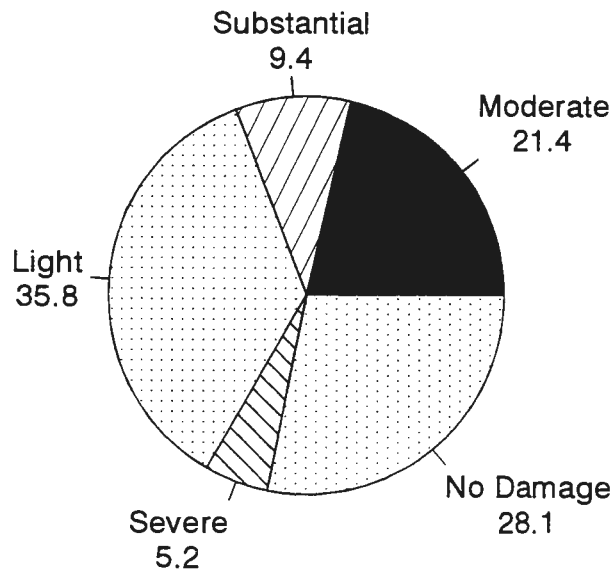
There was a sharp contrast in feelings toward deer between the random and permit sample (Fig. 5). In the random sample, approximately 52% either enjoyed seeing deer around or could accept the current level damage, 26% enjoyed a few deer but worried about crop damage, 14% regarded deer as a nuisance, and 8% had no particular feeling concerning deer. In the permit sample, over 81% of the producers either worried about crop damage or regarded deer as a nuisance. Clearly, deer are enjoyed by many of the respondents; however, in a competitive industry with often small profit margins, about half were worried about damage from deer.

DEMOGRAPHIC DATA

The average non-farm income for the random sample was \$38,419.63, and the farm income for the random sample was \$97,829.79. The average non-farm income for the permit sample was \$26,518.52, and the farm income for the permit sample was \$82,207.03.

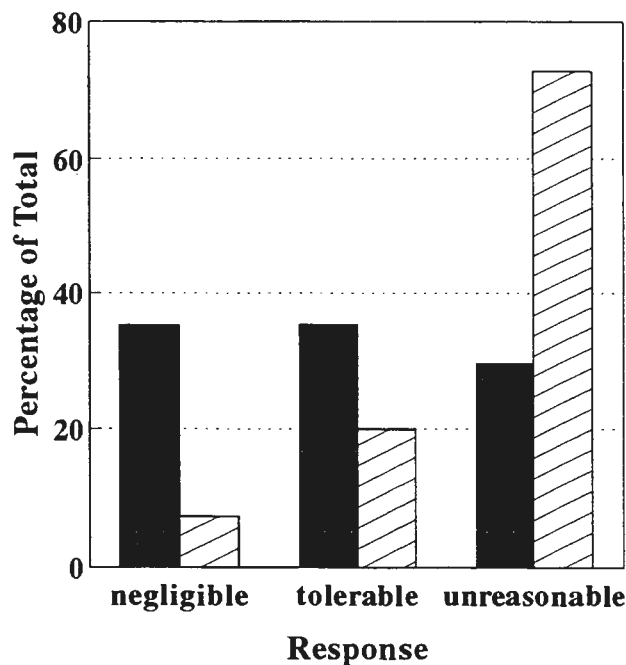
Both samples showed post-high school educations. The random sample's average education

Random Sample



Smathers, Stratton, and Shipes 1993 (Question 7)

Fig. 2. Crop damage from deer.



Random (n=768)
 Permit (n=165)

Smathers, Stratton, and Shipes 1993 (Question 10)

Fig. 3. Amount of deer damage to crops caused by deer.

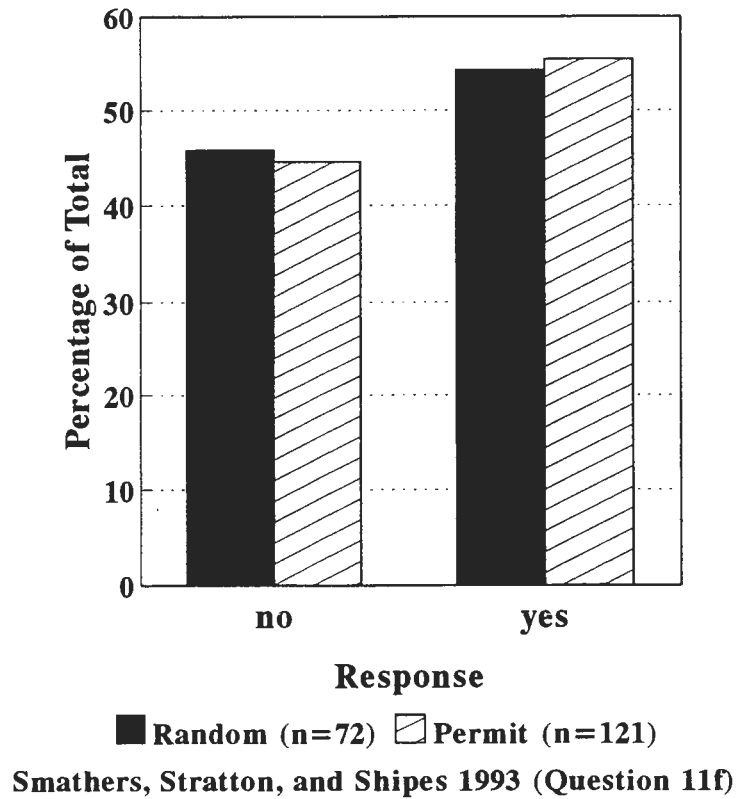


Fig. 4. Effectiveness of shoot-to-kill permits.

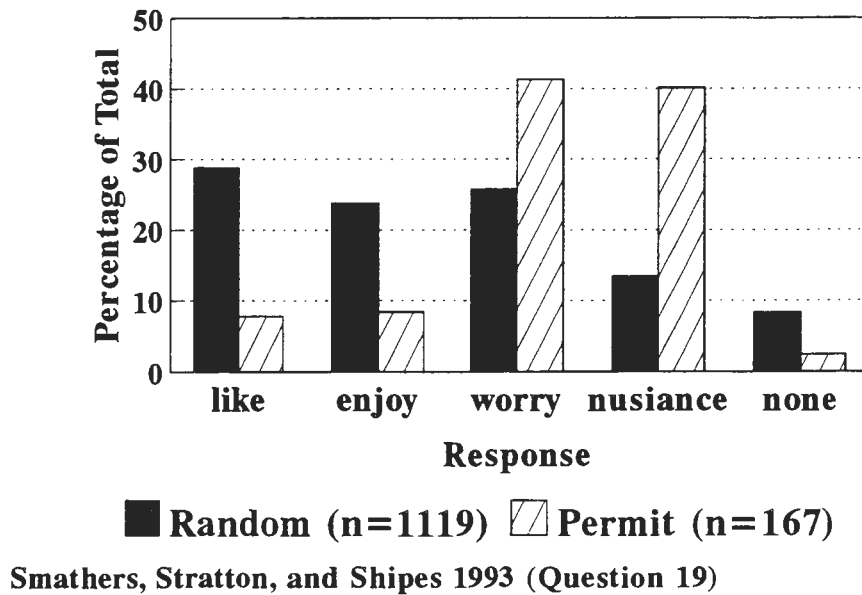


Fig. 5. Feelings regarding present deer population.

level was 13.6 years, while the average education level of the permit sample was 12.6 years.

The vast majority of the respondents in both sample was male. In the random sample 1009 (92.1%) males and 87 (7.9%) females responded. In the permit sample 157 (95.2%) males and 8 (4.8%) females responded.

CONCLUSIONS AND IMPLICATIONS

In South Carolina increasing deer populations and problems with crop damage are regional in nature, with certain regions of the state being affected more than others. Both increasing deer populations and crop damage caused from those deer seems to be of a higher magnitude in the "Low Country" near the coast of South Carolina and in the areas affected by Hurricane Hugo. These two areas of South Carolina are also where the largest number of row crop farms are located.

Generally speaking, about one-third of the agricultural producers in South Carolina reflect the attitude they are substantially negatively affected by deer damage to crops. These areas of damage are expanding with the increasing size of the deer herd, especially in the areas with significant habitat alteration caused by Hurricane Hugo, as well as in areas where large areas of wood products have been

harvested. Increased doe harvest by sportsmen and a changing attitude by landowners toward hunters will be required to alleviate the damage from white-tailed deer in South Carolina. Landowners and sportsmen alike must consider themselves as wildlife managers and not just economic or recreational users of wildlife, especially as harvest decisions are made and carried out as related to white-tailed deer.

LITERATURE CITED

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